

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE J		PAGE OF PAGES 1 12	
2. AMENDMENT/MODIFICATION NO. 0004		3. EFFECTIVE DATE 16-Dec-2004		4. REQUISITION/PURCHASE REQ. NO. W16ROE-4302-4908		5. PROJECT NO.(If applicable)	
6. ISSUED BY USA ENGINEER DISTRICT, NEW YORK ATTN:CENAN-CT ROOM 1843 26 FEDERAL PLAZA NEW YORK NY 10278		CODE W912DS		7. ADMINISTERED BY (If other than item 6) See Item 6			
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)				X		9A. AMENDMENT OF SOLICITATION NO. W912DS-05-B-0002	
				X		9B. DATED (SEE ITEM 11) 22-Nov-2004	
						10A. MOD. OF CONTRACT/ORDER NO.	
						10B. DATED (SEE ITEM 13)	
CODE		FACILITY CODE					
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS							
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.							
12. ACCOUNTING AND APPROPRIATION DATA (If required)							
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.							
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.							
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).							
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:							
D. OTHER (Specify type of modification and authority)							
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.							
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) The solicitation is amended as follows: 1. To incorporate and reissue revised drawings; 2. To incorporate and reissue revised specifications; 3. To incorporate contractor(s) submitted questions and provide answers to such, herein. The bid opening date remains unchanged. NOTE: OFFERORS MUST ACKNOWLEDGE RECEIPT OF THIS AMENDMENT BY THE DATE SPECIFIED IN THE SOLICITATION (OR AS AMENDED) BY ONE OF THE FOLLOWING METHODS: IN THE SPACE PROVIDED ON THE SF1442, BY SEPARATE LETTER, OR BY TELEGRAM, OR BY SIGNING BLOCK 15 BELOW. FAILURE TO ACKNOWLEDGE AMENDMENTS BY THE DATE AND TIME SPECIFIED MAY RESULT IN REJECTION OF YOUR BID IN ACCORDANCE WITH THE LATE BID, LATE MODIFICATIONS OF BIDS OR LATE WITHDRAWAL OF BIDS (FAR14.304). Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.							
15A. NAME AND TITLE OF SIGNER (Type or print)				16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)			
				TEL: _____ EMAIL: _____			
15B. CONTRACTOR/OFFEROR _____ (Signature of person authorized to sign)		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)		16C. DATE SIGNED 16-Dec-2004	

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

SECTION SF 30 - BLOCK 14 CONTINUATION PAGE

The following have been added by full text:

AMENDMENT 0004

AMENDMENT 0004 TO DRAWINGS AND SPECIFICATIONS FOR FY 05 Military Entrance Processing Station (MEPS), Niagara Falls Air Reserve Station – W912DS-05-B-0002

TO BIDDERS

The following changes shall be made to the drawings and specifications.

DRAWINGS

1. The following DRAWINGS have been **REVISED** but not **REISSUED**:

a. A-601, Door Schedule; **REVISE** the hardware for the doors indicated below:

<u>Door number</u>	<u>Delete Hardware Set</u>	<u>& Provide Following</u>
133	HW-9	HW-4
134	HW-9	HW-4
135	HW-9	HW-4
137	HW-9	HW-4
140	HW-9	HW-4

b. A-601, Door Schedule; **ADD** “(at all exterior glazing)” after the ‘G4’ note in the Glass types section.

c. A-604, Window and Louver Details; In window detail ‘E’, **REPLACE** the four ‘G2’ notations with ‘G4’.

E-01, Symbols, Abbreviations and Electrical Site Plan; In the communication note **REPLACE** “fo cables be fusion spliced. UG shall be installed through bored trenches” with “fiber optic cables shall be fusion spliced. UG shall be installed through bored or excavated trenches.”

2. The following DRAWINGS have been **REVISED** and **REISSUED**:

a. M-701, AHU 1,2,3 Control Schematic (inadvertently left off amendment #3)

SPECIFICATIONS

1. The following SPECIFICATION SECTIONS have been **ADDED** and are provided in their entirety herein:

- a. 07600
- b. 09100

2. The following SPECIFICATIONS SECTIONS have been **REVISED AND REISSUED** in their entirety:

- a.) 08120

The following SPECIFICATIONS have been **REVISED** but not **REISSUED**:

a. **Section 08710**, Doors Hardware; Paragraph 3.6, Hardware, subparagraph 3.6, Hardware Sets:

Subparagraph 3.6.3 - HW-3: **DELETE** "Push-Button Lockset (proximity)" and **REPLACE** with "Entry proximity lockset tied to card reader function."

Subparagraph 3.6.4 - HW-4: **DELETE** "1 lockset tied to card reader function" and **REPLACE** with "1 Push button combination lockset."

b. **Section 00800**, SPECIAL CONTRACT REQUIREMENTS; 42. STORMWATER POLLUTION PREVENTION PLAN, NOTICE OF INTENT AND NOTICE OF TERMINATION, Paragraph c: Provided herein a partially completed copy of the NOI, inadvertently omitted from specification. Also, included with the NOI is information and evaluations explaining erosion control plan development for this project this additional information is located on the contract CD under references.

c. **Section 00800**, COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK, Paragraph 1: REPLACE paragraph f as it appears with the following: "Hours of Work: Unless otherwise specified, the Contractor will be permitted to perform the contract work between the hours of 7:45 am and 4:30 pm, Monday through Friday. Federal Holidays that fall within the workweek will not be considered as workdays. Prior to performing any work during hours other than those specified, the Contractor shall submit an overtime request to the Contracting Officer for review and approval. Overtime requests shall be submitted no less than two full workdays prior to the time the Contractor desires to perform the overtime work."

d. **Section 00800**, COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK, Following Paragraph 1.h, ADD the following:

"i. The Construction Limits, as defined herein, are located within Niagara Falls JARS property limits. Daily construction work site clean up shall be accomplished by the Contractor. This clean up shall include the placing of construction material and equipment in a neat and orderly arrangement. Rubbish, debris, rubble and garbage shall not be permitted to accumulate. If the Contractor has any dumpsters in the construction limits, they shall be clearly marked with a sign "for private use only, not for use of base personnel." Dumpsters shall be

emptied when contents mounds to height of sides. At the end of the workday, the Contractor shall inspect the site to ensure that all paper, cardboard and similar materials are removed to provide a litter free appearance. Upon completion of all work outlined in the contract drawings and specifications, the Contractor shall remove from the confines of the Base, his construction materials and his equipment. The Construction limits, office and storage trailer locations must be kept clean and in an orderly manner at all times. Storage of materials/debris under the trailers is prohibited. Failure to do so will result in the Government with holding of additional retainage until the construction area is cleaned.

j. Cleanliness: The Contractor shall protect Government property and furnishings that may be in or adjacent to the work area with appropriate clean drop cloths, barricades, dust-stops, or other provisions as determined by, or approved by, the Contracting Officer Representative prior to starting work. The Contractor shall remove all debris, tools, materials and equipment and other items when work is completed in each particular area.

k. Daily Clean Up: Daily construction site clean up shall be accomplished by the Contractor. This clean up shall include the placing of construction material and equipment in a neat and orderly arrangement on the site. Equipment and materials must not block access to existing facilities. The Contractor shall inspect the site and area on a daily basis to ensure that all rubbish, debris, rubble, garbage paper, cardboard, demolition products and similar materials removed to provide a litter-free appearance. On-Base access routes utilized by construction equipment and/or delivery vehicles shall be maintained free from clay or mud balls, clods and mud. During the growing season (April through October), all grass areas in the Contractor's construction area or within ten feet of Contractor construction areas or within ten feet of buildings or portions of buildings under construction shall be mowed and trimmed to maintain neat grassy areas of reasonable length, by the Contractor. Grass height shall never be allowed to exceed six (6) inches.

l. Construction equipment may not be stored at work sites long term. If equipment is not used for a period of 30 calendar days, the equipment must be removed from site. The Contracting Officer Representative must approve exceptions to this condition, such as equipment required at a later date.

m. Parking on the grass is not permitted. The Contractor will not be allowed to drive on grass with his vehicles to gain access to the work sites, unless the grass area is within the construction limits. The Contractor and their personnel must park their vehicles within the construction limits or as otherwise designated by the Contracting Officer.

n. Phasing of Work: Work to be accomplished in occupied building, or that will interrupt utilities, must be coordinated with the Contracting Officer Representative.

o. **Daily Work Schedules:** In order to closely coordinate work under this contract, the Contractor shall prepare for and attend a weekly coordinating meeting with the Contracting Officer Representative and using service, at which time the Contractor shall submit for coordination and approval, his proposed daily work schedule for the next two week period. Required temporary utility services, time and duration of interruptions, and protection of adjoining areas shall be included with the Contractor's proposed two-week work schedule. At this meeting, the Contractor shall also submit his schedule of proposed dates and times of all preparatory inspections to be performed during the next two weeks. The items of work listed on the proposed two-week schedule are to be keyed to the Network Analysis Schedule (NAS) by activity number and description for each activity anticipated to be performed during the next two-week period. Coordination action by the Contracting Officer Representative relative to these schedules will be accomplished during these weekly meetings.

p. **Fire Protection: Welding, Burning and Cutting Operations:** Welding Operation: All welding and burning operations shall be accomplished in strict compliance with the requirements outlined in the National Fire Protection Association Standard, and the Department of the Army Corps of Engineers General Safety requirements Manual EM 385-1-1. Prior to starting welding, cutting, brazing, burning and/or any other flame or spark producing operations, the Contractor or Subcontractor performing the work shall obtain a burning permit for the Base Fire Department. This permit, USAF Welding, Cutting and Brazing (AF Form 592), is the only acceptable authorization for performance of this type of work. The request for this permit can be accomplished by contacting the Niagara Falls JARS Fire Department at. A Fire Department representative will respond to the work site, evaluate the site conditions and issue the required permit as required. Under normal conditions, the Fire Department representative will respond to the work site within one hour after receiving the request for the permit for that day. A copy of each permit shall be retained at the project site until work for which the permit was issued is completed. The Contractor or Subcontractor shall provide required equipment, materials, shield, extinguishers, sand and other devices at each location where work of the type requiring a permit is conducted.

q. **Environmental Protection:** The Contractor shall provide and maintain environmental protection during the life of the contract as defined herein. Environmental protection shall be provided to correct conditions that might endanger the environment during normal construction operations.

1. **Vegetation and Mulch:** Temporary protection shall be provided on side and back slopes when rough grading is complete or when sufficient soil is exposed to require protection to prevent erosion. Protection shall be afforded by accelerated growth of permanent vegetation, temporary vegetation, mulching or netting. Slopes too steep for stabilization by other means shall be stabilized by hydro seeding, mulch anchored in place, covering the anchored netting, sodding, or such

combination of these and other methods as may be necessary for effective erosion control.

2. Disposal of Solid Waste: The Contractor shall transport waste off Government property, and disposal shall be in a manner that complies with Federal, State and Local requirements. The Contractor shall provide the Contracting Officer Representative with a copy of the State and/or Local permit or license, which reflects such agencies disposal authorization. The permit or license, and the location of the disposal area, shall be provided to the Contracting Officer Representative prior to transporting materials off Government property.

3. Prosecution of work within Wetland Areas: The Contractor will not be allowed to work within the Wetlands nor its buffer zones. Construction of the new utilities that are located within the wetland areas or connection to existing utilities within the wetland areas, will only be allowed once the appropriate New York State Agency(s) has approved the Air Force's permit application.

r. Temporary Construction: Upon completion and acceptance of the construction, the Contractor shall remove all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, debris and other vestiges of construction. All areas shall be restored to pre-contract construction conditions, including grading, sodding and other restorations.

s. Landscape Protection: Provide protection for all existing landscape features such as trees, shrubs, bushes, plantings and sod in and around the area of construction. No existing tree, shrubs, bushes or other items shall be affected in any way, by Contractor actions, unless required by specifications. Prior to any demolition or construction in proximity to any existing landscape feature, the feature shall be protected by fencing, barricades, temporary removal and/or other approved devices. When construction requires that heavy machinery work in close proximity to existing mature trees, the trees shall be protected. All damaged items shall be replaced at no additional cost to the Government in kind with new, by the Contractor.

t. Trenching and Excavation: Excavation and related work shall be completed in scheduled phase between blocks or manholes for installations requiring testing. Work shall be barricaded in accordance with Corps of Engineer Manual EM 385-1-1. For excavations in which testing is not required, the trenches shall be backfilled at the end of the day except for the last 15 feet. Backfilling must be accompanied daily; established structures and plantings must be avoided; excavation shall not begin until material and equipment for the specified portion of the job is available on the site. Trenches or excavations which cut roads, parking lots, driveways and delivery routes shall be fully coordinated between the Contractor, and the Contracting Office Representative a minimum of five (5) days prior to excavation. The Contractor shall provide non-skid surface, steel road

plates until the vehicle routes are permanently repaired. Excavations and the repair that will traverse completely across vehicle routes shall be scheduled in stages that allow crossing of vehicles until road plates and/or permanent repairs are in place.

u. Barricades are required in accordance with the referenced safety regulations. Each job site will be clearly identified by signs, and protected by barriers suitably marked by reflective materials, and illumination for easy sighting after dark.

v. Dumpsters: Equip dumpsters with a secure cover. The cover shall be closed at all times, except when being loaded with trash and debris. Locate dumpster(s) behind the construction fence or out of the public view. Empty site dumpsters at least once a week, or as needed to keep the site free of debris and trash. If necessary, provide 208-liter (55-gallon) trash containers to collect debris in the construction site area. Locate the trash containers behind the construction fence or out of public view. Large demolition normally requires a large dumpster without lids-these are acceptable but should not have debris higher than the sides before emptying.

w. Temporary Sanitation Facilities: All temporary sewer and sanitation facilities shall be self-contained units with both urinals and stool capabilities. Ventilate the units to control odors and fumes and empty and clean them at least once a week or more often if required by the contracting officer. The doors shall be self-closing. Locate the facility behind the construction fence or out of the public view.

x. Construction and Safety Fence: The contractor shall enclose the project work area, contractor parking, and contractor lay-down area with a snow type construction fence. The contractor shall provide and install all necessary gates in the fence. Remove the fence upon completion and acceptance of the work. The intent is to block the construction from public view. The purpose of the fence is to protect the public from construction activities. In addition, safety fences shall be used to enclose those areas not within the construction fence. The safety fence will match the base standard [Confirm with BCE and state the color] [and/or bright orange where it protects excavated areas], high density polyethylene grid or approved equal, a minimum of 1.1 m (42 inches) high, supported and tightly secured to steel posts located on a minimum 3 m (10 foot) centers. The contractor must remove the fence from the work site upon completion of the contract.

y. Pass and Identification:

1. Employee and Vehicle Passes

The Contractor shall obtain the necessary passes and/or identification for entry into Niagara Falls JARS for themselves and all employees prior to commencement of work. The Government reserves the right to refuse to issue a pass to any and all employees of the Contractor for any reason deemed valid by the Government and

in doing so shall not be subject to the equitable adjustment or contract disputes act. The Government will issue passes depending on the type of work to be completed and the length of the contract. The Contractor shall be responsible for obtaining additional passes upon the expiration of each pass issued. Obtaining a vehicle pass does not guarantee that vehicles covered by the pass will not be inspected. Vehicle inspections are at the discretion of the Government.

2. Access Procedures

The Contractor shall provide Contracting Officer or his representative an Entry Authorization List of individuals requiring access to Niagara Falls JARS. The Entry Authorization List, on Contractor's Letterhead and for each individual requiring access, shall include: Contractor's Name, name of individual, address, social security number and driver's license number (number and state of issue). The Contractor shall allow two working days for the Installation to process passes for individuals. The Government reserves the right to deny access to any questionable individuals. Revisions to the Entry Authorization List shall be provided to the Contracting Officer as names of individuals are added or deleted from the list. Registered individuals with valid driver's license and picture identification will be permitted to Check-in at the gate. The only type of motor vehicles that are allowed through the gate is a small vehicle (motor cycles, cars, vans, and pickup trucks). Vehicles and attendees are subject to search at the discretion of the Government.

3. Heightened Alert Conditions

Conditions caused by Force Majeure (acts of war, terrorism, nature, etc.) shall be addressed via contract time extension at no cost only. The Contractor shall anticipate that in the event of heightened alert, access to Niagara Falls JARS may be denied for approximately three to five days. The Contractor shall also anticipate that during periods of heightened alert, time required to access Niagara Falls JARS may increase threefold for a period of seven days."

e. Section 088520N, Aluminum Windows; ADD subparagraph 1.7, which follows:

"1.7 Antiterrorism Requirements.

1.71. Aluminum framing members shall be designed base on a 0.2% offset yield strength equivalent static design loads per windows shall be 7 kilopascals applied to the surface of the glazing and frames. Deformation shall not exceed 1/60 of the unsupported member lengths.

1.72. Glazing frame bite. The glazing shall have a minimum frame bite of 9.5mm for structurally glazed systems and 25mm for window systems that are not structurally glazed.

1.73. Connection Design. Equivalent static design loads for connections of the windows to the surrounding walls shall be 75 kilopascals for glazing panels less than 1 square meter and 30 kilopascals for glazed panels greater than 1 square meter, but less than 3 square meters. Loads shall be applied to the surface of the glazing and frame.

Connections and hardware shall be designed based upon a 0.2% offset yield strength for aluminum.”

f. Section 088020, Glazing. ADD subparagraph 2.1.6, which follows:

“2.1.6 Laminated Glass

ASTM C1172, Kind LA fabricated from two nominal 3.125mm thick pieces of type I class I, quality q3, flat annealed transparent glass conforming to ASTM C 1036 and in accordance with UFC 4-010-01. Flat glass shall be laminated together with a minimum of 0.75mm thick clear polyvinyl butyral interlayer. The total thickness shall be nominally 6.25mm. Provide at interior lite of insulated glass unit.”

g. Section 02703, HOT-MIX ASPHALT (HMA) FOR ROADS; Paragraph 2.1.4, DELETE Table 2 in its entirety and REPLACE it with the Following:

“Table 2. Aggregate Gradations

<u>Sieve Size</u>	<u>Wearing Course</u>	<u>Binder Course</u>
NYDOTSS	Type 8	Type 8

Note regarding Table 2: Wearing and Binder Course may be placed in one lift or section.”

BIDDER’S QUESTIONS AND GOVERNMENT REPLY

(Questions that may be of general interest of all bidders/Government and that are not readily answered by the proceeding changes will appear below. These questions may have been paraphrased or altered to represent several questions regarding the same subject and/or clarify and simplify the question(s). Questions and answers are issued to the Offerors/Bidders for information only.)

Question (Q): Are there any requirements for a temporary construction fence? Who is responsible for cutting/maintenance during construction? **Section 0800 has been amended in the above to address this question.**

Q: Are there any specifications for temporary construction facilities. **Section 0800 has been amended in the above to address this question.**

Q: Is there a specification for testing for Mechanical and electrical equipment?

R: Specifications for testing of Electrical Systems are located within each specification. For example, field testing, ground resistance test, cable testing, etc are found in Part 3 of specification section 16415. These paragraphs further includes/references to industry standard (ANSI, IEEE, NEMA, etc) in conducting these testing.

Q: Drawing E-10, Electrical Key Notes.

R: Elevation (Drawing grid location F-9) is incorrect and should read 595.50.

Q: Addenda #1- Bid Form, Item #0007 (Optional Bid Item #4); Is the intent that under the Base Bid the entire site gets seed only and under this option landscaping/plantings, sod, and irrigation system would be added? **R: Yes.**

Q: Section 06410, Laminate Clad Architectural Casework, Paragraph 2.1.1.1, Standing and Running Trim; Please specify if red or white oak will be required. There is a significant price difference. Drawings only call out oak. **R: Either type of oak is acceptable.**

Q: Under amendment #3 it states that drawing M-701 has been revised and reissued, but the drawing does not appear in the plans that were issued under amendment 3. Is M-701 revised? If so, what is the revision? **R: Drawing, M-701 has been revised and was inadvertently left off amendment #3. The revised drawing is issued with amendment #4.**

Q: Is there a specification for testing for Mechanical and Electrical Systems? **The specification contain numerous requirement for testing and commissioning; e.g. 15995A, Commissioning of HVAC Systems.**

Q: On addenda #1 – Bid Form – Item #0007 (optional bid item #4) is the intent that under the base bid the entire site gets seed only and under this option landscaping/plantings, sod, and the irrigation system would be added? **R: Yes.**

Q: In spec section 06410 – Laminate Clad Architectural Casework – Paragraph 2.1.1.1 – Standing and Running Trim, please specify if red or white oak will be required – there is a significant price difference. Drawings only call out 'oak'. **R: Red Oak will be required.**

Drawing E-01-Electrical Site Plan Key Notes

Q: In the communication notes it says "UG ducts shall be installed through bored trenches". Is all underground electrical to be installed in bored trenches? Please provide bored trench detail. **R: No. The communication note calling for bored trenches has been revised per this amendment to read, "bored or excavated trenches"; thus allowing the contractor the choice.**

Q: Regarding item 7a; are the existing ducts/conduit to be removed or abandoned in place? If removal is required are the conduits concrete encased? **R: Per communication instructions above item #7, "..... Replaced cable shall be removed". Except for the underground ducts within the footprint of the building, all the other existing UG comm. line ducts are direct buried (D/B). None of the existing UG comm. lines are concrete encased.**

Q: Regarding item 7b; is the new 6 way duct bank to be concrete encased? **R: No**

Q: Regarding item 7b; Is MH2 existing? **R: No. Only MHs 1, 3 and the comm. vault are existing as indicated by arrowed "(EXIST)" adjacent to the label.**

Q: Regarding items 8b and c; are conduits to be concrete encased? **R: No**

Q: Regarding item 9a; are replaced lines to be removed or abandoned? If removal is required are the lines direct burial or in conduit? Are they concrete encased? **R: Replaced lines are to be removed except for the underground ducts within the footprint of the building, all the other existing UG comm. lines are direct buried (D/B). and none of the lines are concrete encased.**

Q: Regarding Item 9a; how does the new cable get from the COMM vault to MH-1? **R: As indicated by the dashed line between the comm. vault and MH-1, and the verbiage '(EXIST) UG DUCTS', the 6-way UG duct extends from MH-3 to the comm. vault (via the new MH-2 and the existing MH-1).**

Q: Regarding Item 9a; are ducts installed in Items 7 and 8 to be utilized to get from MH-1 to Building 807 or is an additional duct required? **R: The reason why we're installing these UG ducts for the comm. lines is for the comm. lines that we'll be installing. Yes, the lines that were installed on items 7 and 8 will be used in running the comm. lines from the comm. vault to B-807 (Via MHs 1,2,3, 4 and the existing manholes north of B-807).**

Q: Regarding Item 9b; is the conduit to be installed in conduit or direct burial? Concrete encasement? **R: Conduit is direct burial. Per previous answer, no comm. lines will be concrete encased.**

Q: Regarding item 10; are replaced lines to be removed or abandoned? If removal is required are the lines direct burial or in conduit? Are they concrete encased? **R: Replaced lines are to be removed and they are not concrete encased.**

Q: Regarding Item 10; how does the new cable get from the COMM vault to MH-1? **R: As indicated by the dashed line between the comm. vault and MH-1, and the verbiage '(EXIST) UG DUCTS', the 6-way UG duct extends from MH-3 to the comm. vault (via the new MH-2 and the existing MH-1).**

Q: Regarding Item 10; are ducts installed in Items 7 and 8 to be utilized to get from MH-1 to Building 807 or is an additional duct required? **R: The reason why we're installing these UG ducts for the comm. lines is for the comm. lines that we'll be installing. Yes, the lines that were installed on items 7 and 8 will be used in running the comm. lines from the comm. vault to B-807 (Via MHs 1,2,3, 4 and the existing manholes north of B-807).**

Q: Regarding Item 11; is the intent that the existing conduit labeled as '11' on the drawing be used to get from the COMM vault to MH3 for the new 300 pair telephone cable and 12-strand SM FO cable? If so, why is it 'X'd' out? **R: Item labeled as '11' is to be replaced, that's why it's 'X'ed out as mentioned on inquiry. The reason this is 'X'ed out is that, new cables (300-pair and 12-strand FO) will be installed through the 6-way ducts from comm. vault to MH-3. When it gets to MH-3, it will be spliced with the other end of the existing 300-pair.**

Q: Regarding Item 11; is Building 204 the structure just west of MH3? **R: No, Building 204 is about 2500 ft (maybe more) west of MH-3.**

Q: Regarding Item 11; it appears a new duct bank is shown from MH3 to the structure just west of MH3 (B204)? Is this correct? **R: Per previous answer, structure just west of MH-3 is not B204. No, a new duct bank will not be installed from the structure indicated on question. Dashed arrow located next to MH-3 indicates that the existing direct buried 300-pair, be re-routed to MH-3 so it could be spliced with the new 300-pair from the comm. vault (now routed through the 6-way ducts).**

Q: Regarding Item 12; is concrete encasement required for the 4 – 4" UG ducts? **R: Per previous answer, no existing or new UG comm. lines will be concrete encased.**

Q: Regarding Item 12; are 4 – 4" UG conduits to be run from MH1 to the COMM vault for this item? Concrete encased? **R: As the project indicates, no new conduits will be installed between MH-1 and the Comm. vault. Therefore, the existing 6-way ducts from MH-1 to the Comm. vault will be used to run the new lines from MEPS.**

Q: Regarding Item 12; are any duct banks to be installed from the COMM vault to B-806? **R: Project does not indicate the installation of new duct banks from the Comm. vault to B-806.**

Q: Regarding Item 13; how does the new cable get from the COMM vault to MH-1? New duct bank? Concrete encased? **R: As indicated by the dashed line between the comm. vault and MH-1, and the verbiage '(EXIST) UG DUCTS', the 6-way UG duct extends from MH-3 to the comm. vault (via the**

new MH-2 and the existing MH-1), therefore no new duct bank is necessary or concrete encasement. The new cable will be routed through the existing UG ducts.

The following questions appeared in amendment #3, the bidders are advised to disregard the previous responses, in lieu of those provided herein:

Q: Are fire extinguishers to be included in the work? **R: R: Drawing, A-101, has been revised and reissued under amendment #2, to show locations of fire extinguishers (FE) and fire extinguisher cabinets (FEC).**

Q: Is the bottom of the footing for the site screens to be 2'-10" below grade per detail 5/A504? **R: Drawing A-504 has been reissued with amendment 3 with the depth of footing indicated in detail 5.**

(End of Summary of Changes)

SECTION 07600

FLASHING AND SHEET METAL

02/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 167	(1999) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A 308	(2002) Steel Sheet, Terne (Lead-Tin Alloy) Coated by the Hot Dip Process
ASTM B 209M	(2002a) Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM B 221M	(2002) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM B 32	(2003) Solder Metal
ASTM B 370	(1998) Copper Sheet and Strip for Building Construction
ASTM D 1784	(2003) Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D 226	(1997a) Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D 41	(1994; R 2000e1) Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D 4586	(2000) Asphalt Roof Cement, Asbestos Free

1.2 General Requirements

Sheet metalwork shall be accomplished to form weathertight construction without waves, warps, buckles, fastening stresses or distortion, and shall allow for expansion and contraction. Cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades shall be performed by sheet metal mechanics. Application of bituminous strip flashing over various sheet metal items is covered in Section 07311 ASPHALT ROOF SHINGLES. Installation of sheet metal items used in conjunction with roofing shall be coordinated with roofing work to permit continuous roofing operations. Sheet metalwork pertaining to heating, ventilating, and air conditioning is specified in Section 15700

UNITARY HEATING AND COOLING EQUIPMENT.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Covering on flat, sloped, or curved surfaces; G, RO

Gutters; G, RO

Downspouts; G, RO

Expansion joints; G, RO

Gravel stops and fascias; G, RO

Splash pans; G, RO

Flashing for roof drains; G, RO

Base flashing; G, RO

Counterflashing; G, RO

Flashing at roof penetrations; G, RO

Reglets; G, RO

Scuppers; G, RO

Copings; G, RO

Drip edge; G, RO

Conductor heads; G, RO

Open valley flashing; G, RO

Eave flashing; G, RO

Indicate thicknesses, dimensions, fastenings and anchoring methods, expansion joints, and other provisions necessary for thermal expansion and contraction. Scaled manufacturer's catalog data may be submitted for factory fabricated items.

SD-11 Closeout Submittals

Quality Control Plan

Submit for sheet metal work in accordance with paragraph entitled "Field Quality Control."

1.4 DELIVERY, HANDLING, AND STORAGE

Package and protect materials during shipment. Uncrate and inspect materials for damage, dampness, and wet-storage stains upon delivery to the job site. Remove from the site and replace damaged materials that cannot be restored to like-new condition. Handle sheet metal items to avoid damage to surfaces, edges, and ends. Store materials in dry, weather-tight, ventilated areas until immediately before installation.

PART 2 PRODUCTS

2.1 MATERIALS

Lead, lead-coated metal, and galvanized steel shall not be used. Any metal listed by SMACNA Arch. Manual for a particular item may be used, unless otherwise specified or indicated. Materials shall conform to the requirements specified below and to the thicknesses and configurations established in SMACNA Arch. Manual. Different items need not be of the same metal, except that if copper is selected for any exposed item, all exposed items shall be copper.

Furnish sheet metal items in 2400 to 3000 mm lengths. Single pieces less than 2400 mm long may be used to connect to factory-fabricated inside and outside corners, and at ends of runs. Factory fabricate corner pieces with minimum 300 mm legs. Provide accessories and other items essential to complete the sheet metal installation. These accessories shall be made of the same materials as the items to which they are applied. Fabricate sheet metal items of the materials specified below and to the gage, thickness, or weight shown in Table I at the end of this section. Sheet metal items shall have mill finish unless specified otherwise. Where more than one material is listed for a particular item in Table I, each is acceptable and may be used except as follows:

2.1.1 Exposed Sheet Metal Items

Shall be of the same material. The following items shall be considered as exposed sheet metal: gutters, including hangers; downspouts; gravel stops and fascias; cap, valley, steeped, base, and eave flashings and related accessories.

2.1.2 Drainage

Do not use copper for an exposed item if drainage from that item will pass over exposed masonry, stonework or other metal surfaces. In addition to the metals listed in Table I, lead-coated copper may be used for such items.

2.1.3 Copper, Sheet and Strip

ASTM B 370, cold-rolled temper, H 00 (standard).

2.1.5 Stainless Steel

ASTM A 167, Type 302 or 304, 2D Finish, fully annealed, dead-soft temper.

2.1.5 Terne-Coated Steel

Minimum of 350 by 500 mm with minimum of 18 kilogram coating per double base box. ASTM A 308.

2.1.6 Aluminum Alloy Sheet and Plate

ASTM B 209M, anodized form alloy, and temper appropriate for use.

[2.1.6.1 Alclad

When fabricated of aluminum, the following items shall be fabricated of Alclad 3003, Alclad 3004, Alclad 3005, clad on one side unless otherwise indicated.

- a. Gutters, downspouts, and hangers
- b. Gravel stops and fascias
- c. Flashing

]2.1.7 Aluminum Alloy, Extruded Bars, Rods, Shapes, and Tubes

ASTM B 221M.

2.1.8 Solder

ASTM B 32, 95-5 tin-antimony.

2.1.9 Polyvinyl Chloride Reglet

ASTM D 1784, Type II, Grade 1, Class 14333-D, 1.9 mm minimum thickness.

2.1.10 Bituminous Plastic Cement

ASTM D 4586, Type I.

2.1.11 Building Paper

ASTM D 226 Type I.

2.1.12 Asphalt Primer

ASTM D 41.

2.1.13 Through-Wall Flashing

Through-wall flashing for masonry is specified in Section 04200 UNIT MASONRY.

2.1.14 Fasteners

Use the same metal or a metal compatible with the item fastened. Use stainless steel fasteners to fasten dissimilar materials.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Base Flashing

Lay the base flashings with each course of the roof covering, shingle

fashion, where practicable, where sloped roofs abut chimneys, curbs, walls, or other vertical surfaces. Extend up vertical surfaces of the flashing not less than 200 mm and not less than 100 mm under the roof covering. Where finish wall coverings form a counterflashing, extend the vertical leg of the flashing up behind the applied wall covering not less than 150 mm. Overlap the flashing strips or shingles with the previously laid flashing not less than 75 mm. Fasten the strips or shingles at their upper edge to the deck. Horizontal flashing at vertical surfaces must extend vertically above the roof surface and fastened at their upper edge to the deck a minimum of 6 inches o.c. with large headed aluminum roofing nails a minimum of 2-inch lap of any surface. Solder end laps and provide for expansion and contraction. Extend the metal flashing over crickets at the up-slope side of chimneys and similar vertical surfaces extending through sloping roofs, the metal flashings. Extend the metal flashings onto the roof covering not less than 115 mm at the lower side of dormer walls, chimneys, and similar vertical surfaces extending through the roof decks. Install and fit the flashings so as to be completely weathertight. Base flashing for interior and exterior corners shall be factory-fabricated. Metal base flashing shall not be used on built-up roofing.

3.1.2 Counterflashing

Except where indicated or specified otherwise, insert counterflashing in reglets located from 230 to 250 mm above roof decks, extend down vertical surfaces over upturned vertical leg of base flashings not less than 75 mm. Fold the exposed edges of counterflashings 13 mm. Where stepped counterflashings are required, they may be installed in short lengths a minimum 200 mm by 200 mm or may be of the preformed one-piece type. Provide end laps in counterflashings not less than 75 mm and make it weathertight with plastic cement. Do not make lengths of metal counterflashings exceed 3000 mm. Form the flashings to the required shapes before installation. Factory-form the corners not less than 300 mm from the angle. Secure the flashings in the reglets with lead wedges and space not more than 450 mm apart; on chimneys and short runs, place wedges closer together. Fill caulked-type reglets or raked joints which receive counterflashing with caulking compound. Caulking is covered in Section 07920 JOINT SEALANTS. Turn up the concealed edge of counterflashings built into masonry or concrete walls not less than 6 mm and extend not less than 50 mm into the walls. Install counterflashing to provide a spring action against base flashing. Where bituminous base flashings are provided, the counter flashing shall extend down as close as practicable to the top of the cant strip. Counter flashing shall be factory formed to provide spring action against the base flashing.

3.1.3 Edge Strip

Hook the lower edge of fascias at least 20 mm over a continuous strip of the same material bent outward at an angle not more than 45 degrees to form a drip. Nail hook strip to a wood nailer at 150 mm maximum on centers. Where fastening is made to concrete or masonry, use screws spaced 300 mm on centers driven in expansion shields set in the concrete or masonry. Where horizontal wood nailers are slotted to provide for insulation venting, install strips to prevent obstruction of vent slots. Where necessary, install strips over 2 mm thick compatible spacer or washers.

3.1.4 Joints

Leave open the section ends of gravel stops and fascias 6 mm and backed

with a formed flashing plate, mechanically fastened in place and lapping each section end a minimum of 100 mm set laps in plastic cement. Face nailing will not be permitted. Install prefabricated aluminum gravel stops and fascias in accordance with the manufacturer's printed instructions and details.

3.1.1.5 Metal Drip Edge

Provide a metal drip, designed to allow water run-off to drip free of underlying construction, at eaves and rakes prior to the application of roofing shingles. Apply directly on the wood deck at the eaves and over the underlay along the rakes. Extend back from the edge of the deck not more than 75 mm and secure with compatible nails spaced not more than 250 mm on center along upper edge.

3.1.1.6 Gutters

The hung type of shape indicated and supported on underside by brackets that permit free thermal movement of the gutter. Provide gutters in sizes indicated complete with mitered corners, end caps, outlets, brackets, and other accessories necessary for installation. Bead with hemmed edge or reinforce the outer edge of gutter with a stiffening bar not less than 20 by 5 mm of material compatible with gutter. Fabricate gutters in sections not less than 2400 mm. Lap the sections a minimum of 25 mm in the direction of flow or provide with concealed splice plate 150 mm minimum. Join the gutters, other than aluminum, by riveted and soldered joints. Aluminum gutters shall be joined with riveted sealed joints. Provide expansion-type slip joints midway between outlets. Install gutters below slope line of the roof so that snow and ice can slide clear. Support gutters on by cleats spaced not less than 900 mm. Adjust gutters to slope uniformly to outlets, with high points occurring midway between outlets. Fabricate hangers and fastenings from metals compatible with the gutters.

3.1.1.7 Downspouts

Supports for downspouts shall be spaced according to the manufacturer's recommendation for the masonry substrate. Types, shapes and sizes are indicated. Provide complete including elbows and offsets. Provide downspouts in approximately 3000 mm lengths. Provide end joints to telescope not less than 13 mm and lock longitudinal joints. Provide gutter outlets with wire ball strainers for each outlet. Provide strainers to fit tightly into outlets and be of the same material used for gutters. Keep downspouts not less than 25 mm away from walls. Fasten to the walls at top, bottom, and at an intermediate point not to exceed 1500 mm on centers with leader straps or concealed rack-and-pin type fasteners. Form straps and fasteners of metal compatible with the downspouts.

3.1.1.7.1 Terminations

Neatly fit into the drainage connection the downspouts terminating in drainage lines and fill the joints with a portland cement mortar cap sloped away from the downspout.

3.1.1.8 Open Valley Flashing

Provide valley flashing free of longitudinal seams, of width sufficient to extend not less than 150 mm under the roof covering on each side. Provide a 13 mm fold on each side of the valley flashing. Lap the sheets not less than 150 mm in the direction of flow and secure to roofing construction with cleats attached to the fold on each side. Nail the tops of sheets to

roof sheathing. Space the cleats not more than 300 mm on centers. Provide exposed flashing not less than 100 mm in width at the top and increase 25 mm in width for each additional 2400 mm in length. Where the slope of the valley is one in 2.67 or less, or the intersecting roofs are on different slopes, provide an inverted V-joint, 25 mm high, along the centerline of the valley; and extend the edge of the valley sheets 200 mm under the roof covering on each side. Valley flashing for asphalt shingle roofs is specified in Section 07311 ASPHALT SHINGLES.

3.1.9 Eave Flashing

One piece in width, applied in 2400 to 3000 mm lengths with expansion joints spaced as specified in paragraph entitled "Expansion and Contraction." Provide a 20 mm continuous fold in the upper edge of the sheet to engage cleats spaced not more than 250 mm on centers. Locate the upper edge of flashing not less than 450 mm from the outside face of the building, measured along the roof slope. Fold lower edge of the flashing over and loose-lock into a continuous edge strip on the fascia. Where eave flashing intersects metal valley flashing, secure with 25 mm flat locked joints with cleats that are 250 mm on centers. Place eave flashing over underlayment and in plastic bituminous cement.

3.1.10 Sheet Metal Covering on Flat, Sloped, or Curved Surfaces

Except as specified or indicated otherwise, cover and flash all minor flat, sloped, or curved surfaces such as crickets, bulkheads, dormers and small decks with metal sheets of the material used for flashing; maximum size of sheets, 375 by 455 mm. Fasten sheets to sheathing with metal cleats. Lock seams and solder. Lock aluminum seams and fill with sealer as recommended by aluminum manufacturer. Provide an underlayment of building paper for all sheet metal covering.

3.1.11 Expansion Joints

Provide expansion joints for roofs, walls, and floors as specified. Expansion joints in continuous sheet metal shall be provided at at 9600 mmt intervals for aluminum. Joints shall be evenly spaced. An additional joint shall be provided where the distance between the last expansion joint and the end of the continuous run is more than half the required interval spacing]. Conform to the requirements of Table I.

3.1.11.1 Roof Expansion Joints

Consist of metal counterflashing, and metal joint cover. Bituminous base flashing is specified in Roofing Section.

3.1.11.2 Floor and Wall Expansion Joints

Provide U-shape with extended flanges for expansion joints in concrete and masonry walls and in floor slabs. Cover plates for wall and floor joints are specified in Section 05500N METAL FABRICATIONS.

3.1.12 Flashing at Roof Penetrations and Equipment Supports

Provide metal flashing for all pipes, ducts, and conduits projecting through the roof surface and for equipment supports, guy wire anchors, and similar items supported by or attached to the roof deck. Goose-necks, rainhoods, and power roof ventilators, are specified in 15700UNITARY HEATING AND COOLING EQUIPMENT..

3.1.13 Single Pipe Vents

See Table I, footnote (d). Set flange of sleeve in bituminous plastic cement and nail 75 mm on centers. Bend the top of sleeve over and extend down into the vent pipe a minimum of 50 mm. For long runs or long rises above the deck, where it is impractical to cover the vent pipe with lead, use a two-piece formed metal housing. Set metal housing with a metal sleeve having a 100 mm roof flange in bituminous plastic cement and nailed 75 mm on centers. Extend sleeve a minimum of 200 mm above the roof deck and lapped a minimum of 75 mm by a metal hood secured to the vent pipe by a draw band. Seal the area of hood in contact with vent pipe with an approved sealant. Sealants are covered under Section 07920 JOINT SEALANTS.

3.1.14 Stepped Flashing

Stepped flashing shall be installed where sloping roofs surfaced with shingles abut vertical surfaces. Separate pieces of base flashing shall be placed in alternate shingle courses.

3.2 PAINTING

Field-paint sheet metal for separation of dissimilar materials. [Finish painting is specified in Section 09900 PAINTS AND COATINGS.]

3.2.1 Aluminum Surfaces

Shall be solvent cleaned and given one coat of zinc-molybdate primer and one coat of aluminum paint as specified in Section 09900 PAINTS AND COATINGS.

3.3 CLEANING

Clean exposed sheet metal work at completion of installation. Remove grease and oil films, handling marks, contamination from steel wool, fittings and drilling debris, and scrub-clean. Free the exposed metal surfaces of dents, creases, waves, scratch marks, and solder or weld marks.

3.4 REPAIRS TO FINISH

Scratches, abrasions, and minor surface defects of finish may be repaired in accordance with the manufacturer's printed instructions and as approved. Repair damaged surfaces caused by scratches, blemishes, and variations of color and surface texture. Replace items which cannot be repaired.

3.5 FIELD QUALITY CONTROL

Establish and maintain a Quality Control Plan for sheet metal used in conjunction with roofing to assure compliance of the installed sheet metalwork with the contract requirements. Work not in compliance with the contract shall be promptly removed and replaced or corrected. Quality control shall include, but not be limited to, the following:

- a. Observation of environmental conditions; number and skill level of sheet metal workers; condition of substrate.
- b. Verification that specified material is provided and installed.
- c. Inspection of sheet metalwork, for proper size(s) and

thickness(es), fastening and joining, and proper installation.

3.5.1 Procedure

Submit for approval prior to start of roofing work. Include a checklist of points to be observed. Document the actual quality control observations and inspections. Furnish a copy of the documentation to the Contracting Officer at the end of each day.

TABLE I. SHEET METAL WEIGHTS, THICKNESSES, AND GAGES

Sheet Metal Items	Copper, kilograms Per Square meter	Aluminum, mm	Stainless Steel, mm	Terne- Coated Stainless Steel, mm	Zinc- Coated Steel, mm
Building Expansion Joints					
Cover.....	4.9	0.81	0.38	0.38	0.6
Waterstop-bellows or flanged, U-type.	4.9	-	0.38	0.38	-
Covering on minor flat, pitched or curved surfaces	6.125	1.02	0.46	0.46	-
Downspouts and leaders	4.9	0.81	0.38	0.38	0.6
Downspout clips and anchors	-	1.02 clip	-	-	-
	-	3.175 anchor	-	-	-
Downspout straps, 50 mm	14.7 (a)	1.52	1.27	-	-
Conductor heads	4.9	0.81	0.38	0.38	-
Scupper lining	6.125	0.81	0.38	0.38	-
Strainers, wire diameter or gage	4.0 gage	3.66 diameter	2.77 diameter		-
Flashings:					
Base	6.125	1.02	0.46	0.46	0.6
Cap (Counter-flashing)	4.9	0.81	0.38	0.38	0.5
Eave	4.9	-	0.38	0.38	0.6
Bond barrier	4.9	-	0.38	0.38	-
Stepped	4.9	0.81	0.38	0.38	-
Valley	4.9	0.81	0.38	0.38	-
Pipe vent sleeve(d)					
Coping.....	4.9	-	-	-	-
Extrusions.....	-	1.91	-	-	-
Sheets,					
corrugated	4.9	0.81	0.38	0.38	-
Sheets, smooth.....	6.125	1.27	0.46	0.46	0.6
Edge strip.....	7.35	1.27	0.635	-	-
Gutters:					
Gutter section.....	4.9	0.81	0.38	0.38	0.6
Continuous cleat.....	4.9	0.81	0.38	0.38	0.6
Hangers,					
dimensions	25 mm x 3 mm	25 mm x 2 mm	25 mm x one mm	-	-

TABLE I. SHEET METAL WEIGHTS, THICKNESSES, AND GAGES

Sheet Metal Items	Copper, kilograms Per Square meter	Aluminum, mm	Stainless Steel, mm	Terne- Coated Stainless Steel, mm	Zinc- Coated Steel, mm
	(a)	(c)			
Joint Cover plates... (See Table II)	4.9	0.81	0.38	0.38	0.6
Reglets (c).....	3.1	-	0.25	0.25	-
Splash pans.....	4.9	1.02	0.46	0.46	-

(a) Brass.

(b) May be lead weighing 19.6 kilograms per square meter.

(c) May be polyvinyl chloride.

(d) 12.25 kilogram minimum lead sleeve with 100 mm flange. Where lead sleeve is impractical, refer to paragraph entitled "Single Pipe Vents" for optional material.

TABLE II. SHEET METAL JOINTS
TYPE OF JOINT

Item Designa- tion	Copper, Terne- Coated Stainless Steel, Zinc-Coated Steel and Stainless Steel	Aluminum	Remarks
Joint cap for building expansion seam, cleated joint at roof	30 mm single lock, standing seam, cleated	30 mm single lock, standing	- - -
Flashings			
Base	25 mm 75 mm lap for expansion joint	25 mm flat locked, soldered; sealed; 75 mm lap for expansion joint	Aluminum producer's recommended hard setting sealant for locked aluminum joints. Fill each metal expansion joint with a joint sealing compound compound. See Section 07920 JOINT SEALANTS.

TABLE II. SHEET METAL JOINTS
TYPE OF JOINT

Item Designation	Copper, Terne-Coated Stainless Steel, Zinc-Coated Steel and Stainless Steel	Aluminum	Remarks
Cap-in reglet	75 mm lap	75 mm lap	Seal groove with joint sealing compound. See Section 07920 JOINT SEALANTS.
Reglets	Butt joint	- - -	Seal reglet groove with joint sealing compound. See Section 07920 JOINT SEALANTS.
Eave	25 mm flat locked, cleated. 25 mm loose locked, sealed expansion joint, cleated	25 mm flat locked, locked, cleated 25 mm loose locked, sealed expansion joints, cleated	Same as base flashing.
Stepped	75 mm lap	75 mm lap	- - -
Valley.	150 mm lap cleated	150 mm lap cleated	- - -
Edge strip	Butt	Butt	- - -
Gravel stops:			
Extrusions	- - -	Butt with 13 mm space	Use sheet flashing beneath and a cover plate.
Sheet, smooth	Butt with 6 mm space	Butt with 6 mm space	Use sheet flashing backup plate.
Sheet corrugated	Butt with 6 mm space	Butt with 6 mm space	Use sheet flashing beneath and a cover plate or a combination unit
Gutters	40 mm lap, riveted and soldered	25 mm flat locked, riveted, and sealed	Aluminum producers recommended hard setting sealant for locked aluminum joints.

(a) Elastomeric flashing shall have 75 mm lap with manufacturer's

TABLE II. SHEET METAL JOINTS
TYPE OF JOINT

Item Designa- tion	Copper, Terne- Coated Stainless Steel, Zinc-Coated	Aluminum	Remarks
	Steel and Stainless Steel		

recommended sealant.

(b) Polyvinyl chloride reglet shall be sealed with manufacturer's recommended sealant.

]

-- End of Section --

SECTION 08120

ALUMINUM DOORS AND FRAMES

09/99

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 605.2 (1992; Addendum 1995) High Performance Organic Coatings on Architectural Extrusions and Panels

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36/A 36M (1997; Rev. A) Carbon Structural Steel

ASTM B 209M (1995) Aluminum and Aluminum-Alloy Sheet and Plate (Metric)

ASTM B 221M (1996) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)

ASTM E 283 (1991) Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

ASTM E 331 (1996) Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

1.2 PERFORMANCE REQUIREMENTS

1.2.1 Structural

Shapes and thicknesses of framing members shall be sufficient to withstand a design wind load of not less than 1.4 kilopascals of supported area or the design wind load indicated with a deflection of not more than 1/60 times the length of the member. Provide glazing beads, moldings, and trim of not less than 1.25 mm nominal thickness. Framing members shall comply with anti-terrorism criteria UDC 4-010-01.

1.2.2 Air Infiltration

When tested in accordance with ASTM E 283, air infiltration shall not exceed 2.63 by 10⁻⁵ cms per square meter of fixed area at a test pressure of 0.30 kPa (80 kilometers per hour wind).

1.2.3 Water Penetration

When tested in accordance with ASTM E 331, there shall be no water penetration at a pressure of 0.38 kPa of fixed area.

1.3 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Doors and frames; G, RO

Show elevations of each door type, size of doors and frames, metal gages, details of door and frame construction, methods of anchorage, glazing details, weatherstripping, provisions for and location of hardware, and details of installation.

SD-08 Manufacturer's Instructions

Doors and frames

Submit detail specifications and instructions for installation, adjustments, cleaning, and maintenance.

1.4 DELIVERY, STORAGE, AND HANDLING

Inspect materials delivered to the site for damage. Unload and store with minimum handling. Provide storage space in dry location with adequate ventilation, free from dust or water, and easily accessible for inspection and handling. Stack materials on nonabsorptive strips or wood platforms. Do not cover doors and frames with tarps, polyethylene film, or similar coverings. Protect finished surfaces during shipping and handling using manufacturer's standard method, except that no coatings or lacquers shall be applied to surfaces to which calking and glazing compounds must adhere.

PART 2 PRODUCTS

2.1 DOORS AND FRAMES

Swing-type aluminum doors and frames of size, design, and location indicated. Provide doors complete with frames, framing members, subframes, transoms, adjoining sidelights, adjoining window wall, trim, and accessories.

2.2 MATERIALS

2.2.1 Anchors

Stainless steel or steel with hot-dipped galvanized finish. Anchoring must comply with antiterrorism criteria UFC 4-010-01.

2.2.2 Weatherstripping

Continuous wool pile, silicone treated, or type recommended by door manufacturer.

2.2.3 Aluminum Alloy for Doors and Frames

ASTM B 221M, Alloy 6063-T5 for extrusions. ASTM B 209M, alloy and temper best suited for aluminum sheets and strips.

2.2.4 Fasteners

Hard aluminum or stainless steel.

2.2.5 Structural Steel

ASTM A 36/A 36M.

2.2.6 Aluminum Paint

Type as recommended by aluminum door manufacturer.

2.3 FABRICATION

2.3.1 Aluminum Frames

Extruded aluminum shapes with contours approximately as indicated. Provide removable glass stops and glazing beads for frames accommodating fixed glass. Use countersunk stainless steel Phillips screws for exposed fastenings, and space not more than 300 mm o.c. Mill joints in frame members to a hairline fit, reinforce, and secure mechanically. Frames must comply with antiterrorism criteria UFC 4-010-01.

2.3.2 Aluminum Doors

Of type, size, and design indicated and not less than 45 mm thick. Minimum wall thickness, 3 mm, except beads and trim, 1.25 mm. Door sizes shown are nominal and shall include standard clearances as follows: 2.5 mm at hinge and lock stiles, 3 mm between meeting stiles, 3 mm at top rails, 5 mm between bottom and threshold, and 17 mm between bottom and floor. Bevel single-acting doors 2 or 3 mm at lock, hinge, and meeting stile edges. Double-acting doors shall have rounded edges at hinge stile, lock stile, and meeting stile edges.

2.3.2.1 Full Glazed Stile and Rail Doors

Doors shall have narrow stiles and rails as indicated. Fabricate from extruded aluminum hollow seamless tubes or from a combination of open-shaped members interlocked or welded together. Fasten top and bottom rail together by means of welding or by 10 or 13 mm diameter cadmium-plated tensioned steel tie rods. Provide an adjustable mechanism of jack screws or other methods in the top rail to allow for minor clearance adjustments after installation.

2.3.3 Weatherstripping

Provide on stiles and rails of exterior doors. Fit into slots which are integral with doors or frames. Weatherstripping shall be replaceable without special tools, and adjustable at meeting rails of pairs of doors. Installation shall allow doors to swing freely and close positively. Air leakage of a single leaf weatherstripped door shall not exceed 2.19×10^{-5} cubic meter per second of air per square meter of door area when tested in accordance with ASTM E 283.

2.3.4 Anchors

On the backs of subframes, provide anchors of the sizes and shapes indicated for securing subframes to adjacent construction. Anchor transom bars at ends and mullions at head and sill. Reinforce vertical mullions with structural steel members of sufficient length to extend up to the overhead structural slab or framing and secure thereto. Reinforce and anchor freestanding door frames to floor construction as indicated on approved shop drawings and in accordance with manufacturer's recommendation. Place anchors near top and bottom of each jamb and at intermediate points not more than 635 mm apart.

2.3.5 Provisions for Hardware

Hardware is specified in Section 08710, "Door Hardware." Deliver hardware templates and hardware to the door manufacturer for use in fabrication of aluminum doors and frames. Cut, reinforce, drill, and tap doors and frames at the factory to receive template hardware. Provide doors to receive surface-applied hardware, except push plates, kick plates, and mop plates, with reinforcing only; drill and tap in the field. Provide hardware reinforcements of stainless steel or steel with hot-dipped galvanized finish, and secure with stainless steel screws.

2.3.6 Provisions for Glazing

Provide extruded aluminum snap-in glazing beads on interior side of doors. Provide extruded aluminum, theft-proof, snap-in glazing beads or fixed glazing beads on exterior or security side of doors. Glazing beads shall have vinyl insert glazing gaskets. Design glazing beads to receive glass of thickness indicated or specified. Glazing is specified in Section 08800N, "Glazing."

2.3.7 Finishes

Provide exposed aluminum surfaces with factory finish of anodic coating or organic coating.

2.3.7.1 Organic Coating

Clean and prime exposed aluminum surfaces. Provide a high-performance finish in accordance with AAMA 605.2 with total dry film thickness of not less than 0.03 mm. The finish color shall be as indicated.

PART 3 EXECUTION

3.1 INSTALLATION

Plumb, square, level, and align frames and framing members to receive doors adjoining sidelights and adjoining window walls. Anchor frames to adjacent construction as indicated and in accordance with manufacturer's printed instructions. Anchor bottom of each frame to rough floor construction with 2.4 mm thick stainless steel angle clips secured to back of each jamb and to floor construction; use stainless steel bolts and expansion rivets for fastening clip anchors. Seal metal-to-metal joints between framing members as specified in Section 07920N, "Joint Sealants." Hang doors to produce clearances specified by manufacturer. After erection and glazing, adjust doors and hardware to operate properly.

3.2 PROTECTION FROM DISSIMILAR MATERIALS

3.2.1 Dissimilar Metals

Where aluminum surfaces come in contact with metals other than stainless steel, zinc, or small areas of white bronze, protect from direct contact by one or a combination of the following methods:

- a. Paint the dissimilar metal with one coat of heavy-bodied bituminous paint.
- b. Apply a good quality elastomeric sealant between the aluminum and the dissimilar metal.
- c. Paint the dissimilar metal with one coat of primer and one coat of aluminum paint.
- d. Use a nonabsorptive tape or gasket in permanently dry locations.

3.2.2 Drainage from Dissimilar Metals

In locations where drainage from dissimilar metals has direct contact with aluminum, provide protective paint, to prevent aluminum discoloration.

3.2.3 Masonry and Concrete

Provide aluminum surfaces in contact with mortar, concrete, or other masonry materials with one coat of heavy-bodied bituminous paint.

3.2.4 Wood or Other Absorptive Materials

Provide aluminum surfaces in contact with absorptive materials subject to frequent moisture, and aluminum surfaces in contact with treated wood, with two coats of aluminum paint or one coat of heavy-bodied bituminous paint. In lieu of painting the aluminum, the Contractor shall have the option of painting the wood or other absorptive surface with two coats of aluminum paint and sealing the joints with elastomeric sealant.

3.3 CLEANING

Upon completion of installation, clean door and frame surfaces in accordance with door manufacturer's recommended procedure. Do not use abrasive, caustic, or acid cleaning agents.

3.4 PROTECTION

Protect doors and frames from damage and from contamination by other materials such as cement mortar. Prior to completion and acceptance of the work, restore damaged doors and frames to original condition, or replace with new ones.

-- End of Section --

SECTION 09100

METAL SUPPORT ASSEMBLIES

08/04

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 463/A 463M	(2002a) Steel Sheet, Aluminum-Coated, by the Hot-Dip Process
ASTM A 653/A 653M	(2003) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM C 645	(2003) Nonstructural Steel Framing Members
ASTM C 754	(2000) Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
ASTM C 841	(2003) Installation of Interior Lathing and Furring

METAL LATH/STEEL FRAMING ASSOCIATION (ML/SFA)

NAAMM ML/SFA MLF	(1991) Metal Lathing and Furring
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UNDERWRITERS LABORATORIES (UL)

UL Fire Resist Dir	(2004) Fire Resistance Directory
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1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Metal support systems; G, RO

Submit for the erection of metal framing, furring, and ceiling suspension systems. Indicate materials, sizes, thicknesses, and fastenings.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the job site and store in ventilated dry locations. Storage area shall permit easy access for inspection and handling. If materials are stored outdoors, stack materials off the ground, supported on a level platform, and fully protected from the weather. Handle materials carefully to prevent damage. Remove damaged items and provide new items.

PART 2 PRODUCTS

2.1 MATERIALS

Provide steel materials for metal support systems with galvanized coating ASTM A 653/A 653M, Z180; aluminum coating ASTM A 463/A 463M, T1-75 ; or a 55-percent aluminum-zinc coating.

2.1.1 Materials for Attachment of Lath

2.1.1.1 Suspended and Furred Ceiling Systems and Wall Furring

ASTM C 841.

2.1.1.2 Nonload-Bearing Wall Framing

NAAMM ML/SFA MLF.

2.1.2 Materials for Attachment of Gypsum Wallboard

2.1.2.1 Suspended and Furred Ceiling Systems

ASTM C 645.

2.1.2.2 Nonload-Bearing Wall Framing and Furring

ASTM C 645, but not thinner than 0.45 mm thickness, with 0.85 mm minimum thickness supporting wall hung items such as cabinetwork, equipment and fixtures.

2.1.2.3 Furring Structural Steel Columns

ASTM C 645. Steel (furring) clips and support angles listed in UL Fire Resist Dir may be provided in lieu of steel studs for erection of gypsum wallboard around structural steel columns.

2.1.2.4 Z-Furring Channels with Wall Insulation

Not lighter than 0.5 mm thick galvanized steel, Z-shaped, with 32 mm and 19 mm flanges and depth as required by the insulation thickness and by electrical box depth.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Systems for Attachment of Lath

3.1.1.1 Suspended and Furred Ceiling Systems and Wall Furring

ASTM C 841, except as indicated otherwise.

3.1.1.2 Nonload-Bearing Wall Framing

NAAMM ML/SFA MLF, except that framing members shall be 400 mm o.c. unless indicated otherwise.

3.1.2 Systems for Attachment of Gypsum Wallboard

3.1.2.1 Suspended and Furred Ceiling Systems

ASTM C 754, except that framing members shall be 400 mm o.c. unless indicated otherwise.

3.1.2.2 Nonload-Bearing Wall Framing and Furring

ASTM C 754, except as indicated otherwise.

3.1.2.3 Furring Structural Steel Columns

Install studs or galvanized steel clips and support angles for erection of gypsum wallboard around structural steel columns in accordance with the UL Fire Resist Dir, design number(s) of the fire resistance rating indicated.

3.1.2.4 Z-Furring Channels with Wall Insulation

Install Z-furring channels vertically spaced not more than 600 mm o.c. Locate Z-furring channels at interior and exterior corners in accordance with manufacturer's printed erection instructions. Fasten furring channels to masonry walls with powder-driven fasteners or hardened concrete steel nails through narrow flange of channel. Space fasteners not more than 600 mm o.c.

3.2 ERECTION TOLERANCES

Framing members which will be covered by finish materials such as wallboard, plaster, or ceramic tile set in a mortar setting bed, shall be within the following limits:

- a. Layout of walls and partitions: 6 mm from intended position;
- b. Plates and runners: 5 mm in 1.9 meters from a straight line;
- c. Studs: 5 mm in 1.9 meters out of plumb, not cumulative; and
- d. Face of framing members: 5 mm in 1.9 meters from a true plane.

Framing members which will be covered by ceramic tile set in dry-set mortar, latex-portland cement mortar, or organic adhesive shall be within the following limits:

- a. Layout of walls and partitions: 6 mm from intended position;
- b. Plates and runners: 5 mm in 3.8 meters from a straight line;
- c. Studs: 5 mm in 3.8 meters out of plumb, not cumulative; and
- d. Face of framing members: 5 mm in 3.8 meters from a true plane.

-- End of Section --